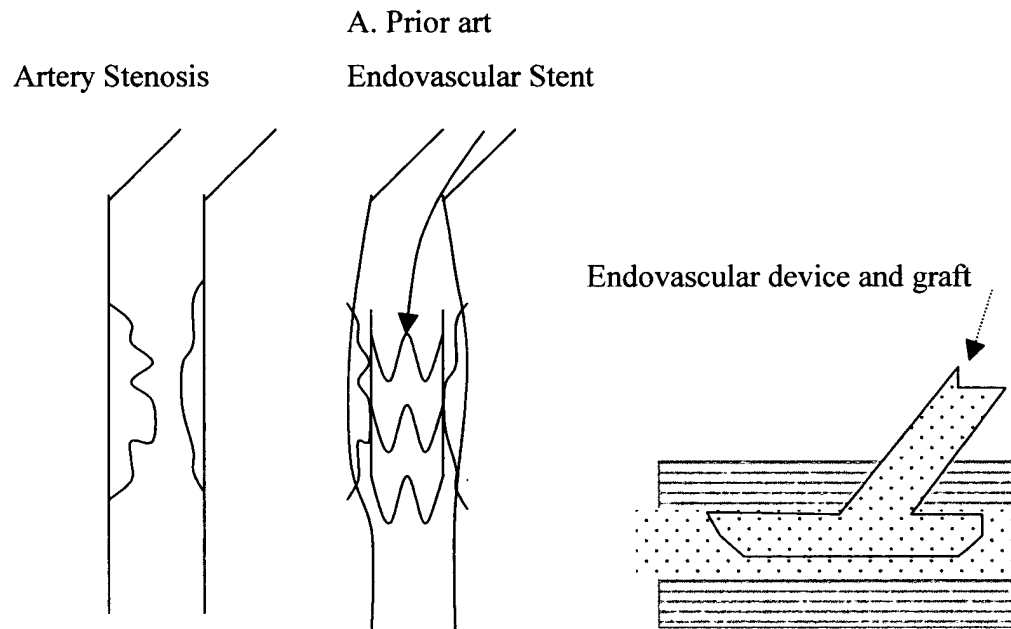
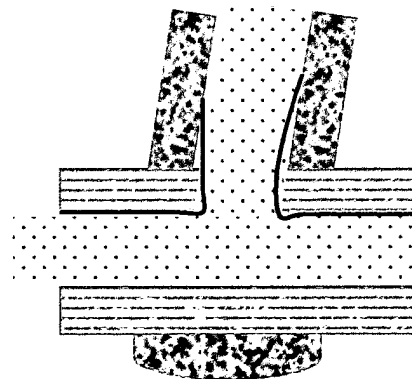


DRAWING 1. MATERIAL & DEVICE FOR ARTIFICIAL AUTOGRAFT



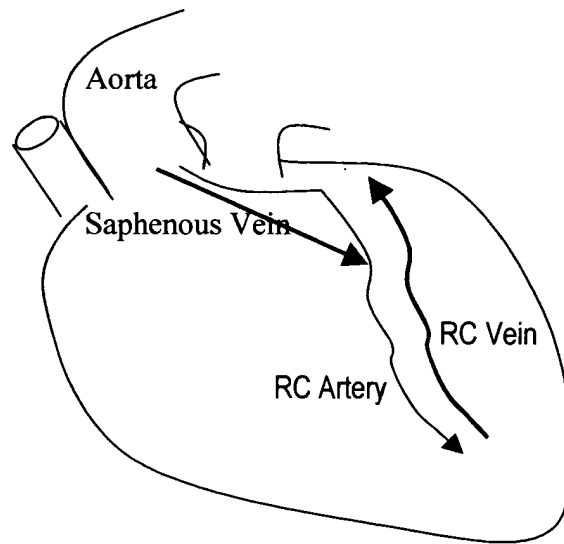
B. Present art

Extravascular connection adhering to the vessel and supporting the endothelium to line out through punched opening and lumen

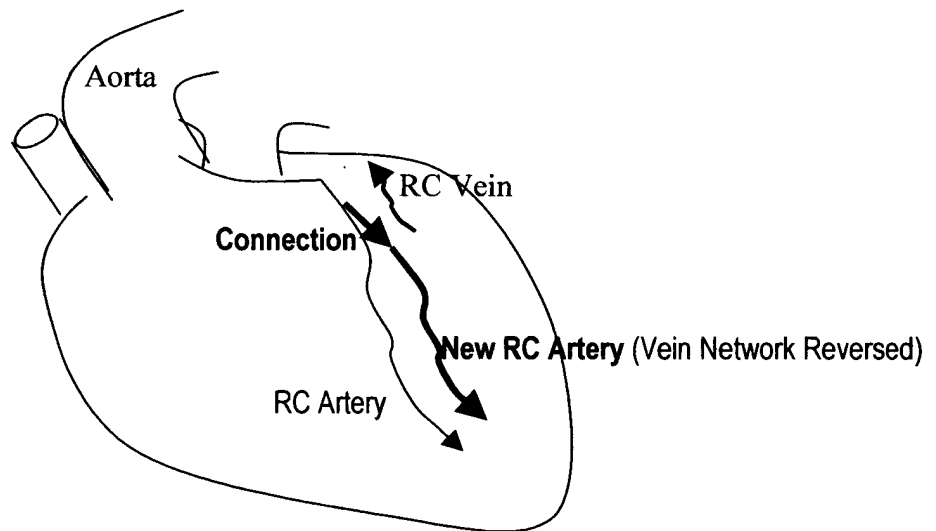


DRAWING 2. REVERSED BYPASS WITH CULTURED VESSEL IN SITU

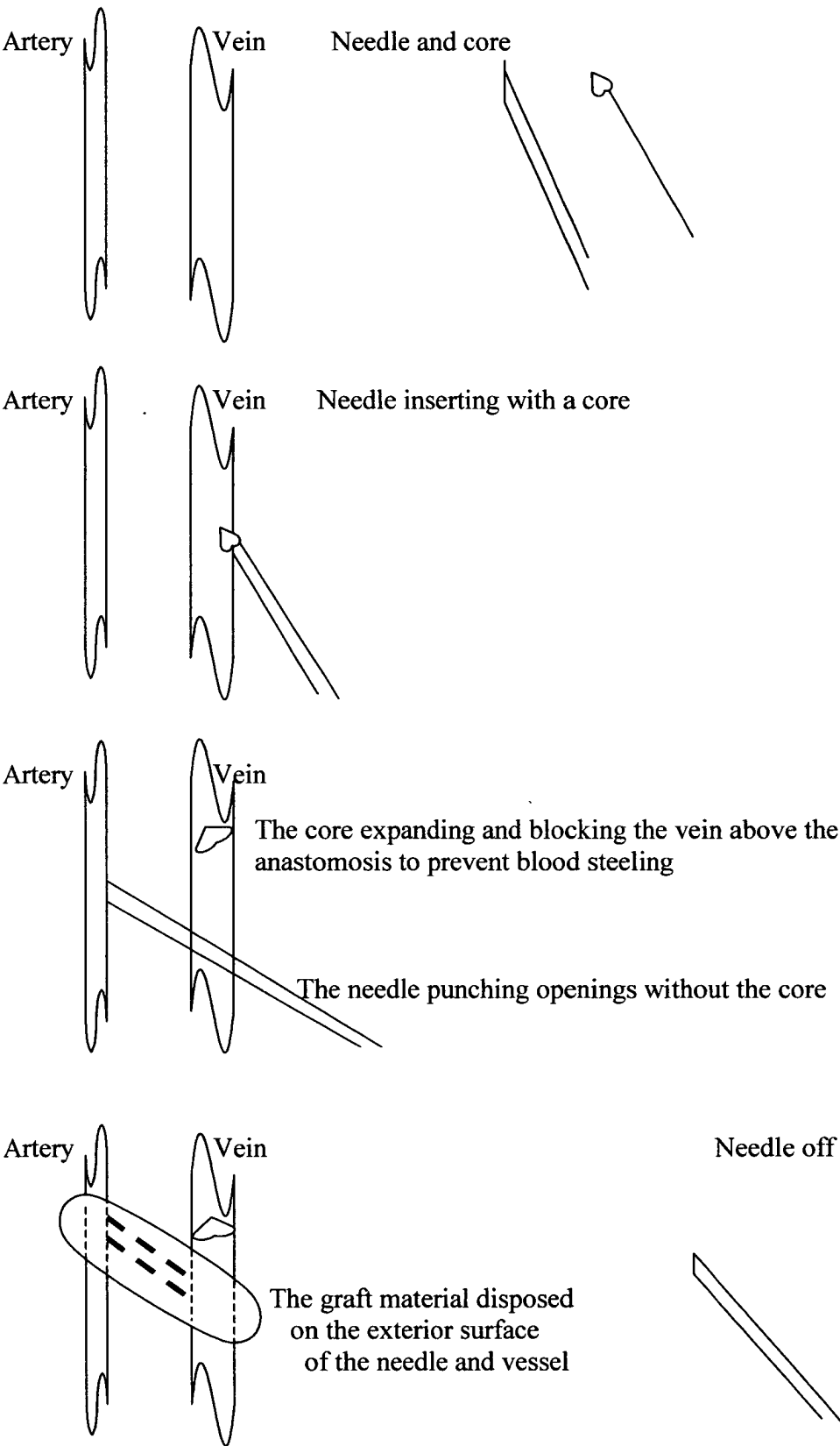
Prior Art: Favoloro & Effler, Cleveland Clinic: Saphenous vein bypass



Present Invention: The extravascular hollow connection leads the artery into a reversed vein

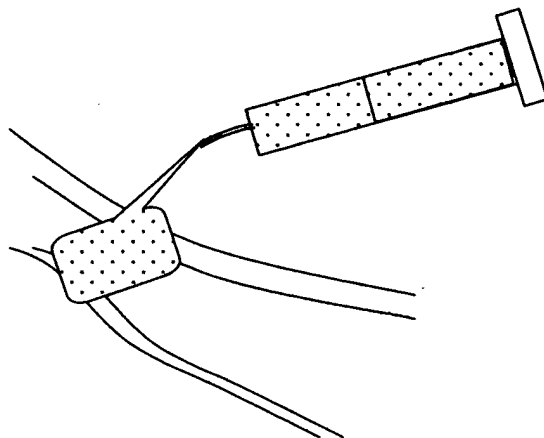


DRAWING 3. SIDE-TO-SIDE VESSEL ANASTOMOSIS

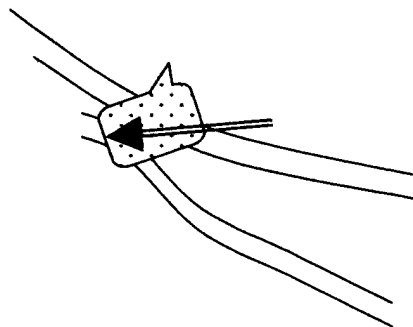


DRAWING 4. ADHESIVE CONNECTION FOR VESSEL ANASTOMOSIS

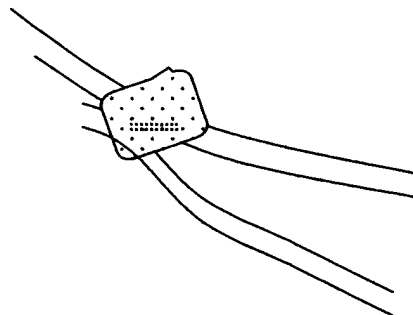
- 1) Inject the graft material between two vessels to adhere the vessels together as a connection.



- 2) Punch the lateral walls of the vessels through the connection to create a lumen

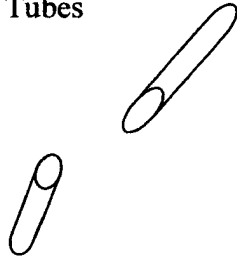


- 3) An autograft is cultured and shaped in situ by the inner surface of the connection.

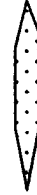


DRAWING 5. ICE CASTING FOR REPAIRING SEVERED TUBES

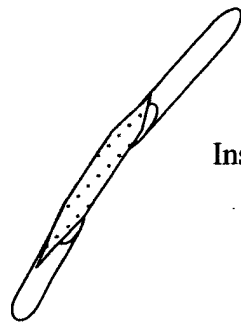
A. Severed Tubes



Removable Ice Casting Mould

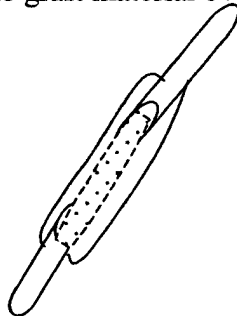


B.

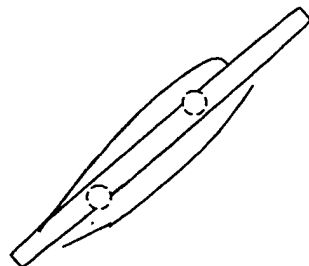


Insert the ice into the open ends of the tubes

C. Dispose the graft material over the exterior surface of the ice and tubes

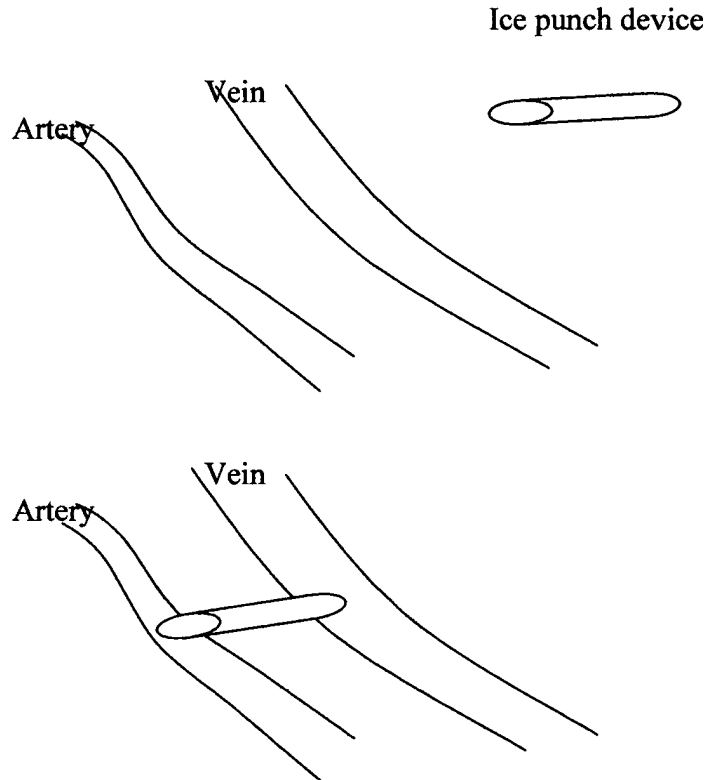


D. After the ice is melted, a lumen is formed within the connection so that an autograft is cultured in a designed shape in situ.

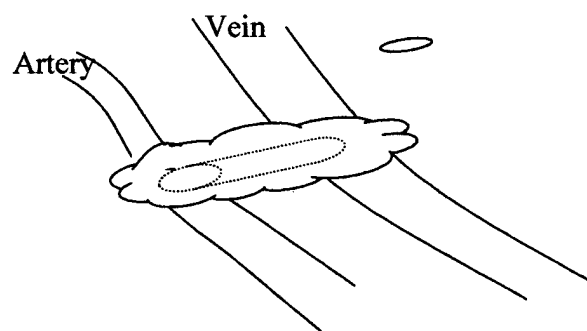


DRAWING 6. VESSEL BYPASS THROUGH ICE PUNCH DEVICE

1). Use an ice punch device to make two openings on the opposite walls of an artery and a vein (side-side)

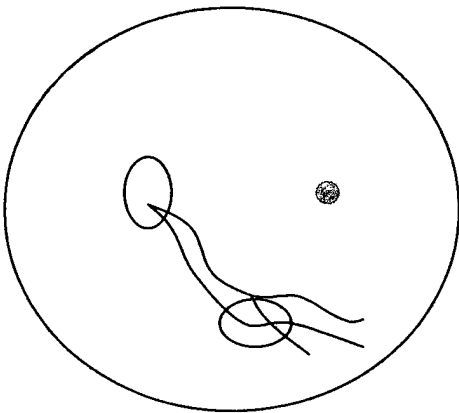


2) Dispose the solidable graft material on the ice device and vessels to form a connection. The connection supports vessel cells, e.g. endothelium, pericyte, to grow and line over its inner surface so that a cultured artificial autograft will take a designed shape in situ.

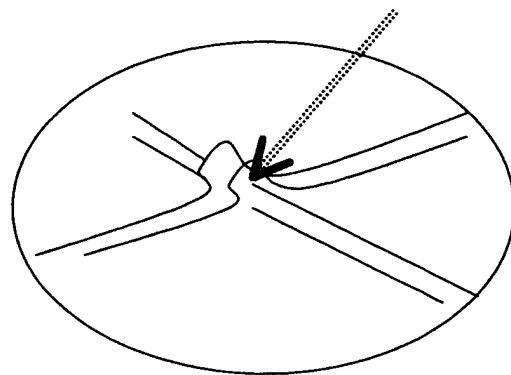


DRAWING 7. LASER BYPASS FROM DISTANCE

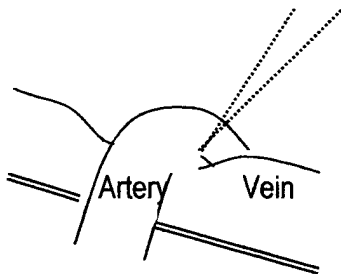
Retinopathy



Laser beam is punching two openings on the opposite walls of an artery and a vein so that the artery blood is flowing into the low resistance vein network.



Laser beam focused on the opposite walls of artery and vein



Laser coagulation

